TABLE 10-continued

α-mode (α1) at the image borders (symmetrical extension, zero-padding, . . .) in dimension j

Step	control	Sa	Sb	Sc	Sd	# cycles	Overlap Memory (R/W/x, level)	Inter-Pass Memory (R/W/x)	Input (R/x)	Data-flow paths	Function	Performed actions
2b		x	2	0	0	M − 1	x	x	x	x	Symmetrical copy of the filter values	Symmetrically copy M-1 coefficients without any filter calculation.
2c		x	2	0	1	1	x	W	x	B2		Symmetrically copy the Mth input value and perform 1 filter calculation
3		0	1	0	1	* α_L^1	x	W	R	C + B2		Load data from input, perform the filtering and write results in the IPM
4a		1	1	1	0	M + 1	W(i-1	R	X	A1 + B1	Prepare the creation of next level	Load data from the IPM of the current level into the filter FIFO for preparing the creation of the next level. Copy the last filter FIFO register into the overlap memory of the previous level for preparing the overlap with the adjacent block.
4b		x	2	1	0	M − 1	W(i − 1	x	x	A1		The Overlap Memory was not completely finished in previous step. This action is continued, while providing symmetrical extension in the FIFO filter structure.
4c		x	2	0	1	1	x	W	x	B2		The symmetrical extension is finalized and the first filtered value is output
5		1	1	0	1	$\frac{\alpha_L^1 - \alpha_i^1}{2^i - M}$	x	R/W	x	B1 + B2	The creation of next level is actually started.	Load data from the IPM, perform the filtering and write results at the same place in the IPM
6	i++; if (i > L) break; else goto step 4a;											

*Note: α_i^1 represents the number of values which have to be read in the input level in order to create the first value in level i in the α1 mode

What we claim is:

1. A method of multi-level iterative digital filtering of a data structure, whereby the elements of the data structure form the zero layer in the zero level and the data layer each subsequent level is given by the results of one iteration, comprising:

subdividing each level into a plurality of regions, there being data dependency between the data in one data layer in one level and the data layers in any other level of a region;

filtering each level by lapped-region processing; and

scheduling the data processing of each level to provide substantially regional synchronization of the filtering at each level.

2. The method of claim **1**, wherein the output from the filtering is a multiresolutional data structure.

3. The method of claim **1**, wherein said filtering includes calculating and outputting a first data layer in a first level from filtering on the zero data layer in the zero level of a first region as well as substantially all the other data layers in the other levels of the first region before outputting any data layer of a second region.

4. The method of claim **1**, wherein each region may contain one or more blocks.

5. The method of claim **4**, additionally comprising block dependent expanding data dependencies between two data layers in two successive levels.

6. The method of claim **5**, wherein the outputs from processing the blocks are scheduled to occur at substantially equal time intervals.

7. The method of claim **1**, wherein the filtering includes traversing the data of one data layer in one level before traversing the data layer of the next level.

8. The method of claim **1**, wherein the data structure has a plurality of dimensions and the filtering includes traversing the data of one data layer in one dimension before traversing the data layer in the next dimension.

9. A method of multi-level iterative digital filtering of a data structure, whereby the elements of the data structure form the zero layer in the zero level and the data layer in each subsequent level is given by the results of one iteration, comprising:

subdividing each level into a plurality of regions, there being data dependency between the data in one data layer in one level and the data layers in any other level of a region;

filtering each level by lapped-region processing; and

selecting the sequence for traversing the regions so that outputs from processing the regions are scheduled to occur at substantially equal time intervals.

10. The method of claim **9**, wherein the output from the filtering is a multiresolutional data structure.

11. The method of claim **9**, wherein said filtering step includes calculating and outputting a first data layer in a first level from filtering on the zero data layer in the zero level of a first region as well as substantially all the other data layers in the other levels of the first region before outputting any data layer of a second region.

12. The method of claim **9**, wherein each region may contain one or more blocks.

13. The method of claim **12**, additionally comprising block dependent expanding data dependencies between two data layers in two successive levels.

14. The method of claim **13**, wherein the outputs from processing the blocks are scheduled to occur at substantially equal time intervals.